includes a ball check valve **82** near the top of the chamber and a sample outlet tube **93** from the sample chamber base **78.** Chamber **39** has a clear cylindrical wall **71** as described in FIG. **4.** Sample outlet tube **93** has an extention **171** leading from the down-stream side of sample control valve **96** to the inlet for the single storage container **166.**

A transient flow characteristic occurs when some substance is added to the fluid flow suddenly to produce a high transient concentration of the substance which would be diluted by pooling samples in a single container. A degradable flow characteristic occurs when a substance is added continuously or suddenly and the substance is of a character such that its presence in the fluid flow is limited in time. Volatile substances or substances which precipitate or otherwise escape from the samples will produce degradable characteristics. Transient flow characteristics may be detected by the embodiments of FIGS. **4** or **13,** whereas degradable characteristics may be detected reliably only by the embodiment of FIG. **13.**

Thus the operation of the embodiment shown in FIGS. **12** and **13** involves sampling for detecting transient or degradable flow characteristics. Hyper-acidity, high base concentrations, chemical contaminants, or present measurements of volatile contaminants may be made. As many probes **167** as are necessary to monitor all of the flow characteristics of this nature are mouned in the chamber **39** for contact with the flow sample as it is drawn into sample chamber **39.** Dwell time of the sample in chamber **39** may be extended by adjustment at fill and measure timer **59** as necessary for measurement of the transient or degradable flow characteristics. The sampling sequence is initiated in the same manner as described for the embodiment of FIG. **3.** An input is provided based on time, flow or a manually initiated input signal for beginning the sampling sequence by energizing power switch **54.** Compressor **86** is turned on and two-cycle timer is initiated. As described above, sample chamber **39** is first purged for fifteen seconds followed by a **30-second** maximum fill period. When the sample in chamber **39** contacts fill level probe **76** the sequence progresses to purge the chamber **39** so that only a volume below the lower end of pipe **73** remains therein. Sample control valve **96** is then energized open to allow the sample volume to drain into storage container **166** through sample outlet tube **93** and extension **171.** Positive pressure is introduced into chamber **39** for a 5-second period thereafter to assist sample drain and to provide a final range through pipe **73,** tube **22,** and intake **19.** At the end of the 5-second final purge, the 2-cycle timer **57** is reset and the sampler is in condition for another sampling sequence to be initiated by the ensuing appropriate input signal as selected at either switch **53** or **52.**

As the sample level rises in sample chamber **39** during the fill period, it immerses probe **167** which senses a predetermined characteristic in the flow sample and conducts an appropriate signal to sensor control circuit **168.** Sensor circuit **168** conditions the sensed signal for presentation to recorder **169** which provides a permanent time base recording of the characteristic being monitored. A plurality of probes **167,** sensor control circuits **168,** and recorders **169** is envisioned for as many characteristics of the flow as may be desired for monitoring.

Referring to FIG. **14** an additional embodiment of the sample chamber **39** is shown. A level sensor **172** is shown positioned so as to sense the level of the fluid inside chamber assembly **39,** but which does not contact the fluid sample contained therein. A capacitance type device, for example, may serve as levelsensor **172.** Level sensor **172** may be adjusted in vertical position on rod **173** and secured in a particular vertical position by means such as knurled nut **174.** FIG. **14** also shows a sample fill pipe **176** which extends from the top cover **74** of sample chamber **39** to a fixed position spaced from sample chamber base **78.** An elongateslot **177** is formed in the portion of sample fill pipe **176** which extends into the interior of sample chamber assembly **39.** A sleeve **178** is slidably fitted to the exterior of fill pipe **176** for vertical positioning thereon. A hole **179** is formed in sleeve **178** and is aligned with elongate slot **177.** A set screw **181** is threadably engaged in a hole (not shown) passing through sleeve **178** for bearing against sample fill pipe **176** to fix sleeve **178** in a preselected vertical position thereon.

The sample chamber assembly **39** of FIG. **14** is designed to operate in the following fashion. Sleeve **178** is adjusted in vertical position on fill pipe **176** until hole **179** defines a predetermined sample volume between the levels of hole **179** and the sample chamber base **78** within cylinder **71.** Sleeve **178** is fixed in the desired position by turning set screw **181** until it bears against fill pipe **176.** When hole **179** is aligned with elongate slot **177** fluid purged from sample chamber **39** during the pressure phase after filling, will be forced out fill pipe **176** until the level falls to the preselected level of hole **179.** Pressure will not bleed from the sample chamber through hole **179,** slot **177,** fill pipe **176** and tube **22.** In this fashion a fluid sample is introduced into sample chamber **39** at the bottom thereof with a minimum of splashing and therefore a minimum of additional oxygen being dissolved into the sample influx. Such additional oxygen solution caused by splashing when the lower end of fill tube **176** is positioned at a considerable height above base **78,** may lead to test analyses which are misleading in determining the nature of the sample drawn.

Level sensor **172** is shown exterior of the cylinder **71** so as to free it from contact with the fluid sample in chamber **39,** whereby it will not be fouled by caustic samples or samples containing a high density of foreign matter. Level sensor **172** is adjusted vertically on rod **173** and fixed in the desired vertical position by knurled nut **174** just above the level of hole **179,** Whenever hole **179** is adjusted in vertical position to provide a new sample volume in chamber **39,** level sensor **172** is similarly adjusted to assume a vertical position a minimal distance above hole **179.** This type of structure reduces the possibility of heavy sedimentary material settling out of the sample during influx of the sample, and consequent purging of the lighter constituents of the sample during the purge phase which brings the sample level down to the level of hole **179.** Without the proximity of levels between level sensor **172** and hole **179** a disproportionate amount of heavy sedimentary material in the sample may remain after purging thus providing misleading results in an analysis of the drawn sample. It is to be emphasized that the lower end of sample fill pipe **176** is positioned at a fixed distance above base **78** which allows unimpeded sample influx and eflux, and which may be found empirically for a given fluid being sampled, and that level sensor **172** is to be positioned at a level only slightly above the level of hole **179.** Any one of a number of means are envi-